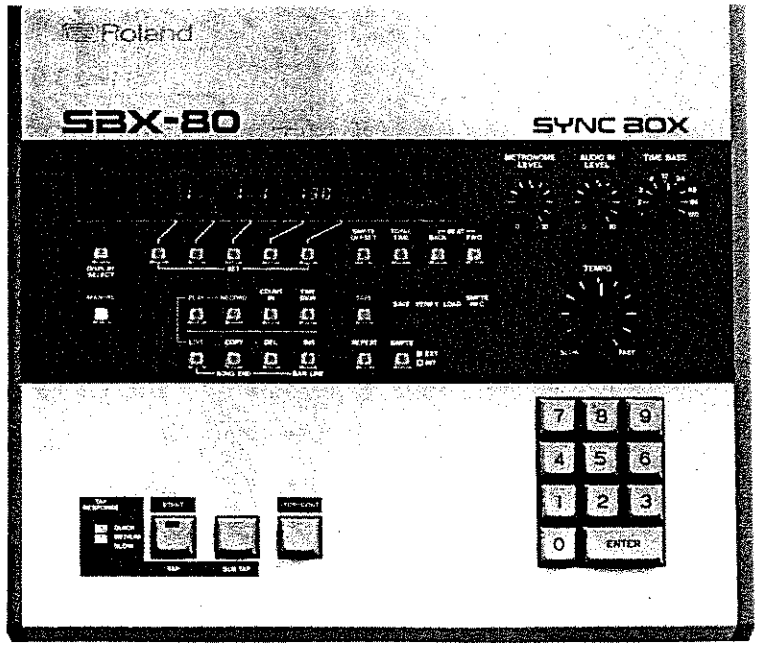
Roland

MIDI SMPTE SYNC BOX

SBX-80

Owner's Manual



CONTENTS

[1] Panel Descriptions 3

[2] Outline of the SBX-80 5

[3] Connections 6

[4] Operation 7

1 Manual Mode 7

a. Start Playing 7

b. Tempo Setting 8
1) Tempo Setting with Tempo Control Knob 8
2) Tempo Setting with Ten Keys 8
3) Tempo Setting with Tap Button . . . 8

c. Setting Beat 9

d. Count In 9

e. Song Select 10

f. Measure Select 10

2. Record Mode 11

a. Tempo Data Programming 1 11
1) Programming with Tap Button 11
2) Tempo Programming with Click Signal 12
3) Changing Beat in the middle of a piece 12
4) Programming Count In 12

b. Tempo Data Programming 2 (using SMPTE Time Code) 13
1) Recording SMPTE Time Code (Basic) 13
2) Tempo data Programming with Tap Button 14
3) Tempo Data Programming by Click Signal 1 14
4) Tempo Data Programming by Click Signal 2 15
5) Changing Beat in the middle of a piece 15
6) Recording SMPTE Time Code (Advanced) 15

c. About SMPTE Time Code 16

3. Edit Mode (Basic) 17

a. Tempo Data Programming by Ten Keys 17

b. A song including different Time Signature 18

4. Play Mode 19

a. Master Tempo Control Mode 19
1) Basic Sync 19
2) Start sync'ing from the measure you select 19
3) Total Time Display 20
4) Repeat (Loop Play) 20
5) Remote Control 20

b. Sync using SMPTE Time Code 21
1) Basic Sync 21
2) Sync with Set Sync Function 22
3) Total Time Display 22

5. Edit Mode 23

a. Editing the Programmed Tempo Data . 23

b. Adding Tempo Data 23

c. Copy Function 24

d. Delete 25

e. Insert 26

f. Song End 27

g. Bar Line 27

6. Save, Verify, Load 29

a. Saving 29

b. Verification 30

c. Loading 31

[5] Applications 32

1. Tempo Time Display 32

a. About Display "2" 32

b. Editing with Display "2" Mode 32

2. Changing Offset Time 34

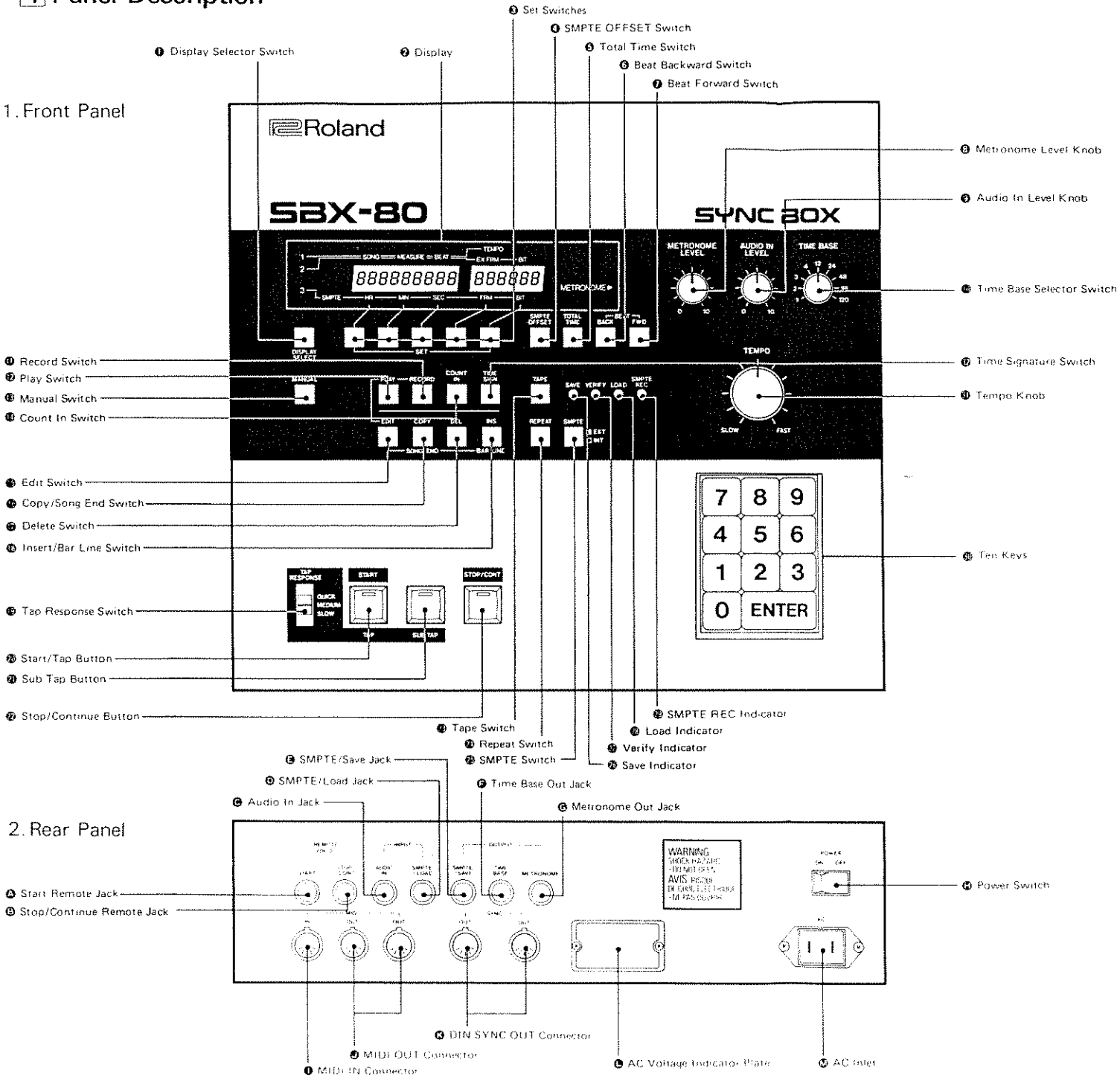
3. Time Display up to a certain beat 35

4. Time Base 35

[6] Specifications 36

1 Panel Description

1. Front Panel



2. Rear Panel

■ Important Notes

- Using the SBX-80 near a neon or fluorescent lamp may cause noise interference. If so, change the angle or position of the SBX-80.
- Avoid using the SBX-80 in extreme heat or humidity or where it may be affected by dust.
- Use a soft cloth and clean only with mild detergent.
- Do not use solvents such as paint thinner.

■ Memory Back-up

The SBX-80 features memory back-up system that retains the data even when switched off. The SBX-80 relies on its batteries for its back-up circuit. Be sure to keep the battery securely connected even during AC operation. Also, always replace with a complete set of the new batteries once a year. If you have changed the batteries with the SBX-80 switched on, the memory can retain the data.

- If the SBX-80 is not to be used for long periods of time, please be sure to switch the power off and remove the batteries, or various troubles may be caused by battery leakage.
- Please observe the following "Battery Replacement".
- Please be sure that the polarities of the batteries are correct.

■ Battery Replacement

Use two 1.5V (UM-3) batteries.

① Remove the battery cover on the bottom of the unit.

② Take out the battery case.

③ Remove the batteries from the battery case.

④ Place a new set of batteries taking care of the polarities.

⑤ Return the battery case into the housing.

⑥ Return the battery cover.

- Please be sure to do the entire battery replacing procedure with the unit switched on. Then the data in memory will be retained.
- Please do not pull the cord hard.

2 Outline of the SBX-80

The Roland SBX-80 is a programmable tempo controller that can be effectively used to control the tempo of sequencers or rhythm machines. This is compatible with almost all rhythm machines and sequencers that have external sync input jacks.

There are three main methods of sync's with the SBX-80.

1. Sync'ing the sequencers and rhythm machines in the tempo set in the SBX-80. There are three different ways of setting the tempo in the SBX-80: one is with the Tempo Control Knob, and the others are by tapping the Tap Button, and by the external click signal.

2. Playing the sequencers and rhythm machines in the tempo recorded in the SBX-80.

   Tempo can be programmed in each beat. By tapping the Tap Button or playing to the click signal in real time, and more, by entering a tempo value in each beat by using the Ten Keys. This unique tempo programming function enables extremely realistic performance of sequencers and rhythm machines.

3. Sync'ing rhythm machines and sequencers to the VTR (Video Tape Recorder) or MTR (Multi Track Recorder).
   The VTR and MTR for professional use adopt SMPTE time code with which sequencers and rhythm machines can be synchronized.
   If tempo is programmed as described in 2, sequencers and rhythm machines are ready to sync with the SMPTE time code.
   Also, if tempo is programmed to the recorded music or picture, by tapping or by using click signal, the sequencers and rhythm machines can sync with the music or picture.
   Even if the SMPTE time code is not written on the tape, you can write it using the SMPTE Time Code Generator provided in the SBX-80. One more advantage of the sync by SMPTE time code is that even the sync from the middle of the music can be successfully done.

Radio and television interference

"Warning – This equipment has been verified to comply with the limits for a Class B computing device, pursuant to Subpart J, of Part 15, of FCC rules. Operation with non-certified or non-verified equipment is likely to result in interference to radio and TV reception."

The equipment described in this manual generates and uses radio-frequency energy. If it is not installed and used properly, that is, in strict accordance with our instructions, it may cause interference with radio and televeision reception.

This equipment has been tested and found to comply with the limits for a Class B computing device in accordance with the specifications in Subpart J, of Part 15, of FCC Rules. These rules are designed to provide reasonable protection against such an interference in a residential installation.

However, there is no guarantee that the interference will not occur in a particular installation. If this equipment does cause interference to radio or television reception, which can be determined by turning the equipment on and off, the user is encouraged to try to correct the interference by the following measure:

- Disconnect other devices and their input/output cables one at a time. If the interference stops, it is caused by either the other device or its I/O cable.

These devices usually require Roland designated shielded I/O cables. For Roland devices, you can obtain the proper shielded cable from you dealer. For non Roland devices, contact the manufacturer or dealer for assistance.

If your equipment does cause interference to radio or television reception, you can try to correct the interference by using one or more of the following measures:

- Turn the TV or radio antenna until the interference stops.
- Move the equipment to one side or the other of the TV or radio.
- Move the equipment further away from the TV or radio.
- Plug the equipment into an outlet that is on a different circuit than the TV or radio. (That is, make certain the equipment and the radio or television set are on circuits controlled by different circuit breakers or fuses.)
- Consider installing a rooftop television antenna with coaxial cable lead-in between the antenna and TV.

If necessary, you should consult your dealer or an experienced radio/television technician for additional suggestions. You may find helpful the following booklet prepared by the Federal Communications Commission:

"How to Identify and Resolve Radio-TV Interference Problems"

This booklet is available from the U.S. Government Printing Office, Washington, D.C., 20402, Stock No. 004-000-00345-4.

Bescheinigung des Herstellers/Importeurs

Hiermit wird bescheinigt, daß der/die/das

Roland SYNC BOX SBX-80
(Gerät, Typ, Bezeichnung)

in Übereinstimmung mit den Bestimmungen der

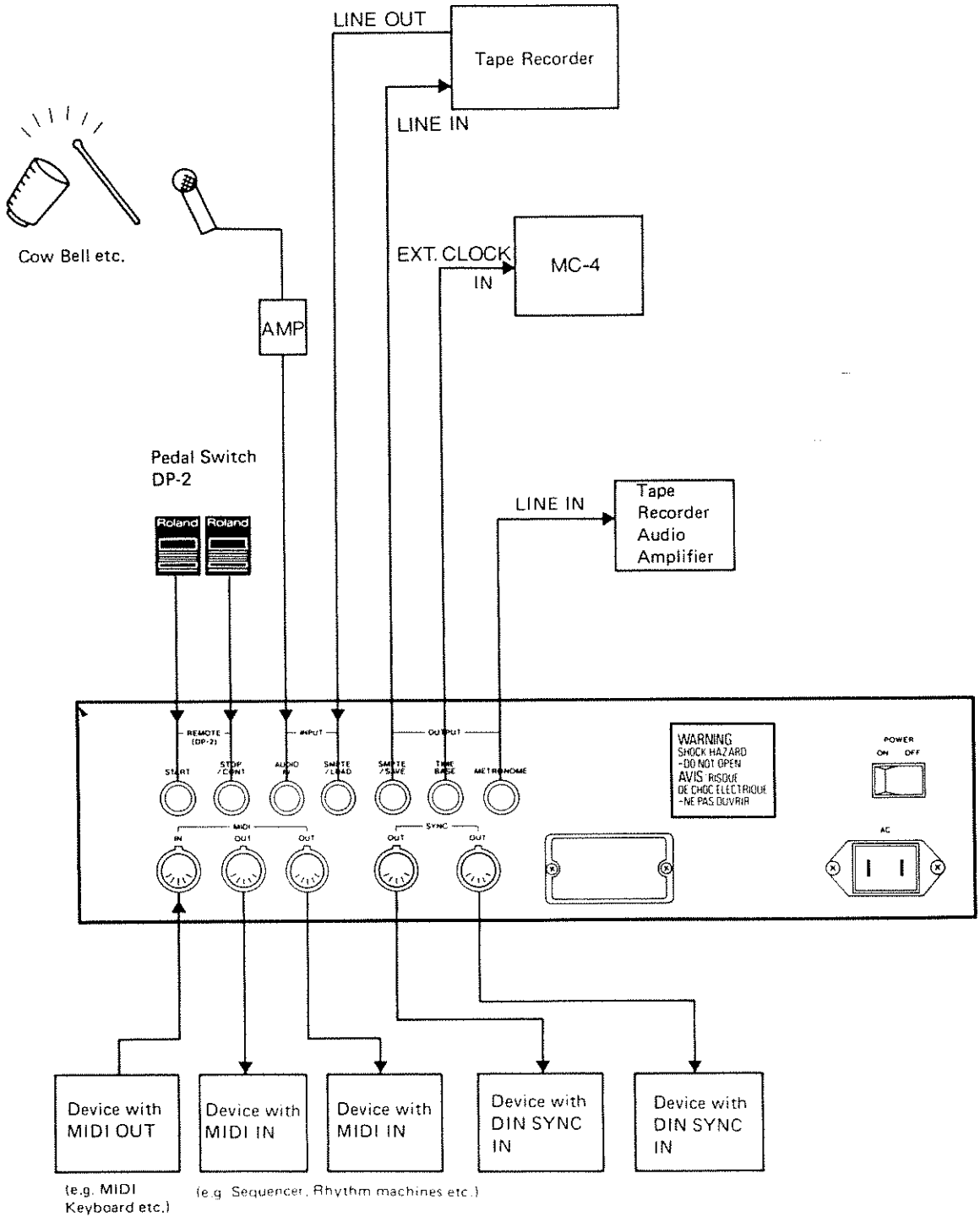
Amtsbl. Vfg 1046/1984
(Amtsblattverfügung)

funk-entstört ist.

Der Deutschen Bundespost wurde das Inverkehrbringen dieses Gerätes angezeigt und die Berechtigung zur Überprüfung der Serie auf Einhaltung der Bestimmungen eingeräumt.

Roland Corporation Osaka/Japan
Name des Herstellers/Importeurs

3 Connections

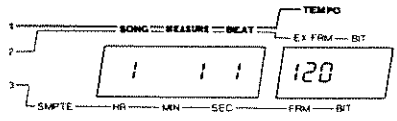


4 Operation

1. MANUAL MODE

On power up, the SBX-80 is set to the Manual Mode. This is the mode to sync the connected sequencers and rhythm machines in the set tempo.

The Display shows Song Number, Measure Number, Beat Number and Tempo Value, from left to right.



Turn the Tempo Control Knob, and you will see the tempo value in the Display change.

a. Start Playing

Operation

(1)Press the Start Button ⑳. The connected sequencers and rhythm machines will play in the set tempo which is shown in the Display ❷.

Note)

(1)The connected units should be set to the External Sync modes.

(2)Press the Stop Button ㉒. The sequencers and rhythm machines will stop playing.

(3)Press the Cont. Button ㉑ again. Music will continue to play from where it was stopped. (This is called "Continue Start".)

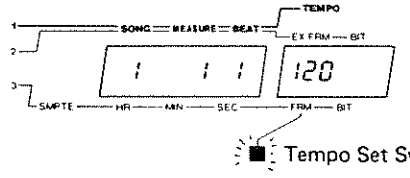
b. Tempo Setting

There are three different methods of tempo setting available in the SBX-80.

1) Tempo Setting with Tempo Control Knob

The Display shows the tempo value you have set.

2) Tempo Setting with Ten Keys



Tempo Set Switch

Operation

(1)Press the Tempo Set Switch ❸. The switch will light up.

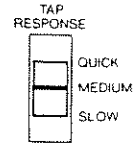
(2)By pressing the relevant Ten Keys ㉚, input a tempo value.

(3)Press the Enter Key ㉛.

Now, the tempo setting is completed. The Tempo Set Switch ❸ goes out.

3) Tempo Setting with Tap Button

In this mode, the tempo is set exactly as you tap the Tap Button ⑳. That is, you can set a tempo in real time.
The Tap Response Switch ⑲ gives you three options. Select the Quick position for setting a tempo by tapping the button twice, and the Medium position for three time tappings. The Slow position is to set a tempo by four time tappings. In all cases, the average tempo of the tappings is calculated.



Tap Response Selector Switch

Operation

(1)Set the Tap Response Switch ⑲ to the desired position.

(2)Tap the Tap Button ⑳ as many time as needed depending on the position of the Tap Response Switch.

The SBX-80 will immediately start operating in the tempo you have set. Press the Stop Button ㉒ to stop the SBX-80.

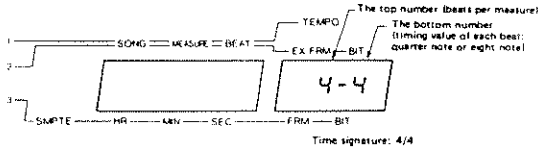
c. Setting Time Signature

By setting a time signature, the music will have bar lines.

Operation

(1)Press the Manual Switch ⓭. The switch will light up and measure number 1 and beat number 1 is automatically selected.

(2)Press the Time Signature Switch ㉜. The switch will light up and the Display will show the current time signature. If you do not need to change it, simply press the Enter Key ㉚ . To change the signature, go to the next step.



Time signature: 4/4

(3)By using the Ten Keys ㉚ , input the desired beat (top number) which is optional from 1 to 15.

(4)Hit the Enter Key ㉚.

Now, the beat number is entered.

(5)Input the bottom number 4(quater note) or 8(eighth note) by pressing the Ten Key ㉚ .

(6)Hit the Enter Key.

Now, the time signature is entered. The Time Signature Switch goes out and the Display is returned to the initial condition (before the Time Signature Switch ㉜ is pressed in the step (2)).

d. Count In

The SBX-80 features Count In function that gives 2 measure lead-In.

Operation

(1)Press the Count In Switch ⓯. The switch lights up, and the Display shows measure number −1.

* Here, pressing the Count In Switch again will cancel the lead-In function. (the Count In switch goes out.)

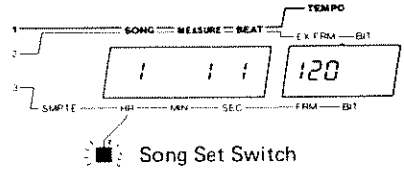
(2)Press the Start Button ⓴. Two measure metronome will be heard, then the SBX-80 starts playing.

e. Song Select

MIDI Format includes Song Select message. If the connected sequencers and rhythm machines are designed to receive MIDI Song Select message, song numbers 1 to 8 can be used to assign a song to be played.

Operation

(1)Press the Song Set Switch ❸. The switch lights up.



Song Set Switch

(2)Input a song number (1 to 8) by pressing the Ten Key.

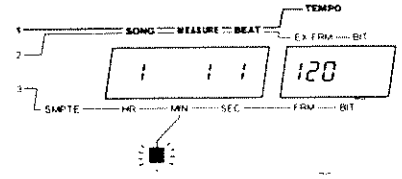
(3)Press the Enter Key ⓾. The Song Set Switch ❸ goes out and the receivers will be ready to play the corresponding song.

f. Measure Select

MIDI Format also includes Song Position Pointer message that allows the SBX-80 to select the measure number of a piece to be played. Naturally this function is effective only if the receiver is designed to receive the message.

Operation

(1)Press the Measure Set Switch ❸. The switch will light up.



Measure Set Switch

(2)Input the measure number by pressing the Ten Keys. The Measure Set Switch ❸ goes out, and the receivers are ready to play the relevant measure.

The measure number can also be set by using the Beat Forward Switch ❼ and Beat Backward Switch ❻.

Operation

Press the Beat Forward Switch ❼ or Beat Backward Switch ❻ until you go to the measure you want.

Each time you press the Forward Switch ❼, one beat number advances as seen in the Display. The measure number is advanced when the beats exceed a measure.
The Backward Switch ❻ works just the other way round.

2. RECORD MODE

In this mode, the tempo can be programmed beat by beat, by tapping the Tap Button ⑳ in real time. For instance, you may program the tempo through a piece, to sync sequencers and rhythm machines to it. Also, you may program the tempo to the recorded music, to sync the sequencers and rhythm machines to the recorded music. Instead of tapping the Tap Button, you may use audio click signal.

a. Tempo Data Programming 1

1) Programming with Tap Button

Operation

(1)Press the Play Switch ⑫ and the Record Switch ⑪ at the same time. The Record Switch lights up, showing the SBX-80 is now in the Record Mode.

(2)Set the desired time signature. (If you do not remember how to set the time signature, refer to "1. Manual Mode c." on page 9).

Note)
The bottom number (4 or 8) of time signature can be set only when all tempo data is cleared.
See (2) - (5) on page 17.

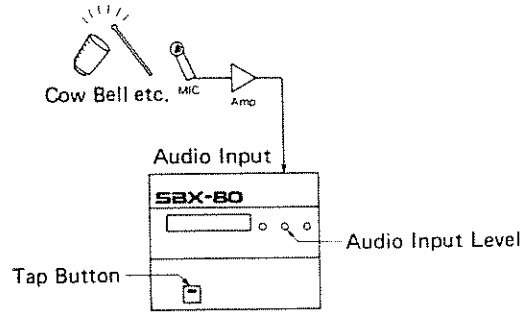
(3)Tap the Tap Button ⑳. Each time you tap, a metronome will be heard, and the Display shows the current beat number, measure number and the programmed tempo value.

(4)When the tempo data is programmed up to the end of the musical piece, press the Stop Button ⑫.

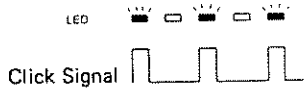
Note)
If sequencers and rhythm machines have been connected to the SBX-80, they will run during above tempo programming. This may interrupt your tapping operation, so turn the volumes down.

2) Tempo Programming with Click Signal

You can program tempo data by feeding a click signal to the Audio In Jack ⓒ on the rear panel.



By rotating the Audio In Level Knob ⓽, adjust the input level of the click signal so that the indicator above the Tap Button will blink in the same tempo as the signal.



Note)
The input level is limited to the line level, so do not connect the microphone directly to the Audio In Jack ⓒ.

3) Changing Time Signature in the middle of a piece

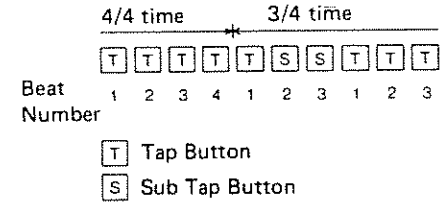
If you wish to change the time during tempo programming by tapping, do as follows.

Operation

(1)Continue the usual tapping operation up to just before the first beat of the measure which you wish to change the time.

(2)From the second beat of that measure, tap the Sub Tap Button ㉑ to set a new beat as many time as necessary.

For instance, to change from 4/4 to 3/4 time, tap the Tap Button ⑳ at the first beat, then tap the Sub Tap Button ㉑ at the second and third beats. Then get back to the usual Tap Button operation.



4) Programming Count In

The Count In function (described on page 9) cannot be obtained in playback, unless it has been programmed in the Record Mode. This Count In function will be specially useful for multitrack recording.

b. Tempo Data Programming 2 (using SMPTE Time Code)

This Tempo Programming by SMPTE time code can be effectively used to sync the rhythm machines and sequencers with the recorded music.
For sync, the SBX-80 uses the SMPTE Time Code written on an empty track (usually the track of the last number) of the multitrack recorder.
It is also possible to sync the sequencers and rhythm machines to the picture of the VTR (for professional use).

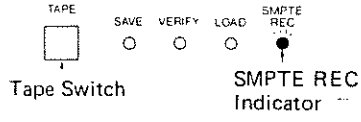
Note)
To start the music from the beginning, it is necessary to program Count In in the music source.

1) Recording SMPTE Time Code (Basic)

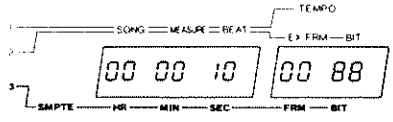
Operation

(1)Connect the Input of the MTR to the SMPTE/SAVE Jack Ⓔ of the SBX-80. And connect the Output of the MTR to the SMPTE/LOAD Jack Ⓓ of the SBX-80.

(2)By pressing the Tape Switch ㉘, light up the SMPTE REC Indicator.



The Display shows the starting time of the SMPTE time code.



(3)Start the MTR in the recording mode, then in 4 or 5 seconds start the SBX-80. The appropriate recording level is –3 to 0 dB VU.
Now, the SMPTE time code is transmitted from the SBX-80 and recorded on the MTR.

(4)To stop the SBX-80, press the Sub Tap Button ㉑.

(5)Stop the MTR, and rewind the tape.

Next step is verifying if the SMPTE time code is correctly recorded on the MTR, and the SBX-80 can read the SMPTE time code from the MTR.

Operation

(1)Press the Play Switch ⑫ to turn the SBX-80 to the Play mode.

(2)Turn the SMPTE Switch ㉕ on.

(3)Turn the tape deck to the Play mode, and start the tape deck.

The moment the SBX-80 starts reading, the SMPTE Switch ㉕ may flare, but it will become stable soon. If the SMPTE Switch goes out even for a second, there is a code reading error. If so, record the SMPTE time code once again.

Note)
Please leave free the track adjacent to the one on which the SMPTE time code is written. Usually, the last track is used to write the code.

2) Tempo Data Programming with Tap Button

Operation

(1)Press the Play Switch ⑫ and the Record Switch ⑪ at the same time. The Record Switch ⑪ will light up showing the SBX-80 is now in the Record Mode.

(2)Set the desired time. If you do not remember how to set the time, refer to "1. Manual Mode c." on page 9).

(3)Press the SMPTE Switch ㉔. The Switch lights up showing that the SBX-80 is now ready to accept the SMPTE time code.

(4)Start the MTR. The Display will show the value of the SMPTE time code currently being set to the SBX-80.

(5)Tap the Tap Button ⑳ to the music.

(6)When the programming is completed, stop the MTR.

3) Tempo Data Programming by Click Signal 1

Instead of tapping the Tap Button, click signal fed through the Audio In Jack ⓒ can be used for tempo programming. Refer to "Record Mode a.-2)" on page 12.

4) Tempo Data Programming by Click Signal 2

The click signal recorded on an empty track of the MTR can be used for tempo programming.

5) Changing Time Signature in the middle of a piece

Refer to "2. Record Mode a-3)" on page 12.

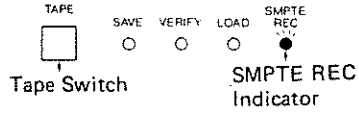
6) Recording SMPTE Time Code (Advanced)

The SBX-80 allows you to set the starting time of the SMPTE time code when recording the code. This time setting is called SMPTE Offset.

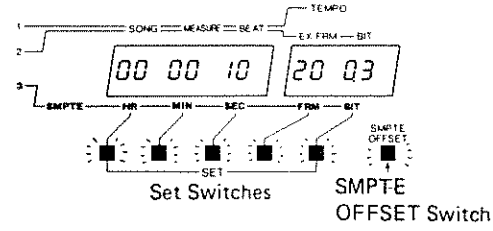
Operation

(1)Connect the input of the MTR to the SMPTE/ SAVE Jack ❺ of the SBX-80.

(2)By pressing the Tape Switch ⓲ light up the SMPTE Indicator.



(3)Press the SMPTE Offset Switch ❹. The SMPTE Offset Switch ❹ and all the five Set Switches ❸ light up. And the Display shows the Offset value (starting time).



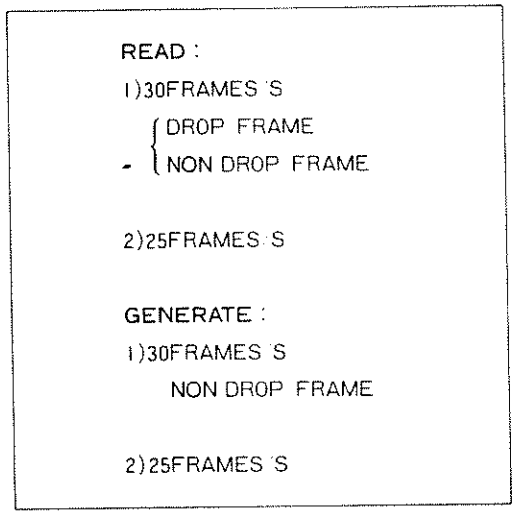
(4)By using the Ten Keys, input each number then hit the Enter Key, from left to right. When a number is entered, the corresponding Set Switch goes out. If you do not wish to change the number, just hit the Enter Key.

(5)When the whole value is entered, the SMPTE Offset Switch ❹ goes out, and the Display is returned to the condition before step (2).

Now, the starting, time of the SMPTE time code is programmed. If you do not remember how to record the SMPTE time code, refer to "2. Record Mode b.-1" on page 13.

c. About SMPTE Time Code

SMPTE time code was initially introduced by the American society called SMPTE (Society of Motion Picture and Television Engineers). It is a position information on the tape, and use for editing the VTR tape. This has been standarized and used even in other countries.
In the music industry, too, this SMPTE time code is used as sync signal for VTR and MTR, or MTR and MTR, and as time information of a computer controlled mixer.
The SBX-80 features the Reader and Generator of the SMPTE time code.



30 FRAMES is mainly adopted in the U.S.A., Canada and Japan, and 25 FRAMES in other countries. This attributes to the differences of television specifications. The SBX-80 has a selector switch for 25 and 30 FRAMES, so when necessary, you can have it changed. Contact your local Roland dealer.

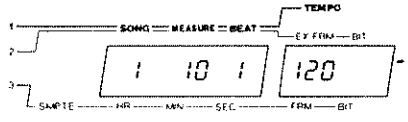
3. EDIT MODE (Basic)

In this mode, tempo programming is done by entering the tempo data in number, using the Ten Keys. Also, the tempo data previously programmed can be edited.

a. Tempo Data Programming by Ten Keys

Operation

(1)Press the Play Switch ⓬ and the Edit Switch ⓯ at the same time. The Edit Switch ⓯ lights up showing that the SBX-80 is now in the Edit Mode. The Display will show the beat number 1.



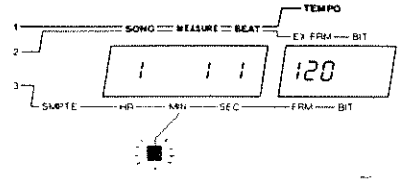
Play Switch

Edit Switch

At this stage, if you wish to program tempo from scratch, clear the data before start programming anything. The following steps (2) to (5) are how to clear the old tempo data.

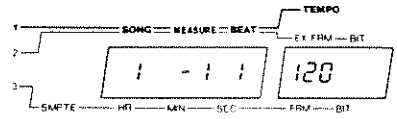
(2)Press the Measure Number Set Switch ❸. The pressed switch lights up.

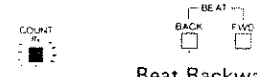
(3)Press the Ten Key 1 then the Enter Key, to enter measure number 1. The Measure Number Set Switch ㉚ goes out showing that the measure number 1 is entered.



Measure Number Set Switch

Note)
If Count In has been programmed (the Count In Switch ⓮ is lighted), set the measure number "−1" by using the Beat Backward Switch ❻.

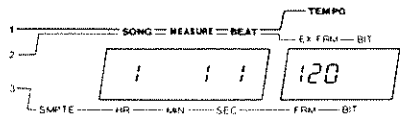




Count In Switch

Beat Backward Switch

(4)Press the Edit Switch ⓯, and while still holding it, press the Song End Switch ⓰. The Edit Switch ⓯ and the Song End switch ⓰ light up.



Edit Switch EDIT ■ ■ Song End Switch SONG END

(5)Hit the Enter Key.

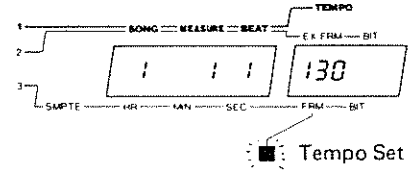
The Song End Switch ⓯ goes out, showing the previously programmed tempo data is now cleared.

(6)Set the desired time. If you do not remember how to set the time, refer to "1. Manual Mode c." on page 9.

(7)Press the Tempo Set Switch ❸. The switch lights up.

(8)Input the tempo value of the first beat in the first measure by using the Ten Keys.

(9)Hit the Enter Key.



Now, the tempo data for the first beat in the first measure is programmed. In the same way, program the tempo data for the following beat. If you want the same tempo value for the next beat, just hit the Enter Key.

b. A Song including different Time Signatures

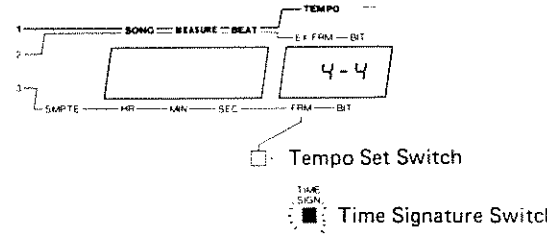
The SBX-80 even allows programming the tempo of the song with different time signatures. Use the Ten Keys to change the beats.

Operation

(1)Continue the usual tempo programming up to the end of the measure just before the measure from which you wish to change the time.

(2)Press the Tempo Set Switch ❸. The switch goes out.

(3)Press the Time Signature Switch ㉗. The switch lights up and the currently programmed time is shown in the Display.



(4)By using the Ten Keys, input the new beat. Here, 1 to 15 can be used to set the beat (the top number of the time signature), but the timing value of each beat (the bottom number of time signature) cannot be changed.

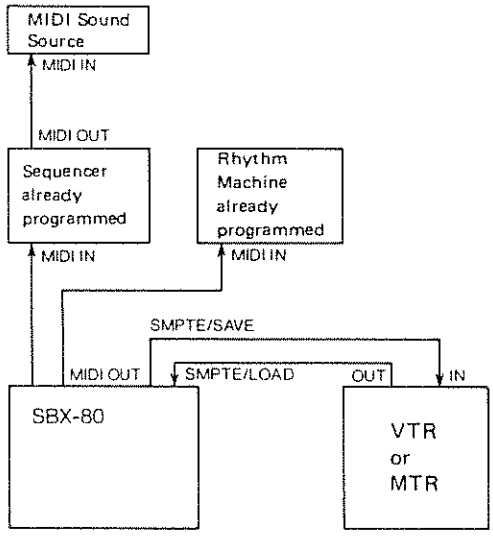
(5)Hit the Enter Key.

Now, you have completed to change the beat. Hitting the Enter Key here will return the Display to the previous indication.

(6)Press the Tempo Set Swtich ❸ again. The switch lights up, and now, tempo programming in the new beat can be started.

4. PLAY MODE

The SBX-80 has two types of playing modes. In one mode, the SBX-80 serves as a master tempo controller. In the other mode, the SBX-80 synchronizes with a VTR and MTR, the sequencers and rhythm machines sync'ing with the SBX-80.



a. Master Tempo Control Mode

1) Basic Sync

Operation

(1)Press the Play Switch ⓬. The switch lights up showing that the SBX-80 is turned to the Play mode.

(2)Press the Start Button ⓴. Now the connected sequencers and rhythm machines start sync'ing.

(3)Press the Stop Button ㉒ to stop playing.

(4)Press the Continue Button ㉒ to continue playing from where it was stopped.

2) Start sync from the measure you select

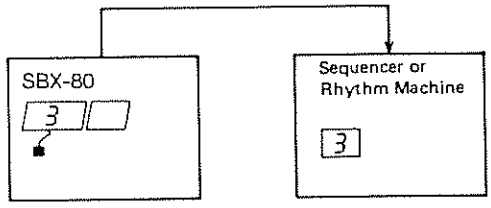
If using the sequencers and rhythm machines that can receive measure selecting message, you can start playing them from any measure you like.

Operation

(1)Press the Measure Number Set Switch ❸. The switch lights up.

(2)By using the Ten Keys, input the number of the measure where you wish to start sync'ing.

(3)Hit the Enter Key ㉚. The Measure Set Switch goes out showing that sync can be started from the set measure.

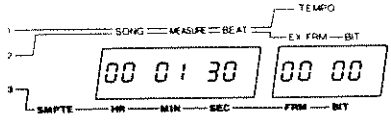


(4)Press the Continue Button ㉒. Sync will start from the set measure. (Pressing the Start Button ⑳ instead of the Continue Button will reset the data.)

3) Total Time Display

Operation

(1)Press the Total Time Switch ❺. The switch lights up, and the Display shows the total time needed for the piece to be played up in the programmed tempo. This, however does not include the lead-in time.



* The Display represents 1 minute 30 seconds.

Total Time Switch

(2)Press the Total Time Switch ❺ again. The switch goes out and the Display returns to condition just before the step (1).

4) Repeat (loop play)

Operation

(1)Press the Repeat Switch ㉑. The switch lights up.

(2)Press the Start Button ⑳. Now the music will play in the tempo programmed in the SBX-80.

(3)Press the Stop Button ㉒. Now, the music stops.

(4)Press the Repeat Switch ㉑ again to cancel the Loop Play.

5) Remote Control

You can enjoy remote control function of the Start, Stop and Continue Start by pedal operation. Connect the DP-2 to the Remote Control Jack on the back panel Ⓐ or Ⓑ.

b. Sync using SMPTE Time Code

The sequencers and rhythm machines connected to the SBX-80 can sync to the VTR or MTR by using the SBX-80. The SBX-80 reads the SMPTE time code from the VTR and MTR, and the sequencers and rhythm machines play to the code being read. The tempo data programmed by using SMPTE time code (b. Tempo Data Program by using SMPTE Time Code on page 13) does not need SMPTE Offset operation, but the tempo data programmed in other methods requires it before played back. The SMPTE Offset operation sets the time when to start sync'ing. The necessary operation for SMPTE Offset is described in "6) Recording SMPTE Time Code" on page 15.

1) Basic Sync

Operation

(1)Press the Play Switch ⑫. The Switch lights up showing that the SBX-80 is now in the playing mode.

(2)Press the SMPTE Switch ㉕. The switch lights up showing that now the SBX-80 is ready to play to the SMPTE time code.

(3)Start the VTR and/or MTR. The SBX-80 now starts reading the SMPTE time code from the VTR and/or MTR. Here, if you select the Display mode "3" by pressing the Display Selector Switch ❶, the Display will respond with the current SMPTE time code. When this SMPTE time code reaches the SMPTE Offset set in the SBX-80, the sequencers and rhythm machines start playing.

(4)Stop the VTR or MTR to stop playing.

About Auto Sync Function

The SBX-80 features the Auto Sync function that can start sync'ing at any position. But if the receiver needs too long a time to find the sync'ing position, or is not able to receive position message at all, this Auto Sync function does not work. Therefore study the following "2) Sync with Set Sync Function".

2) Sync with Set Sync Function

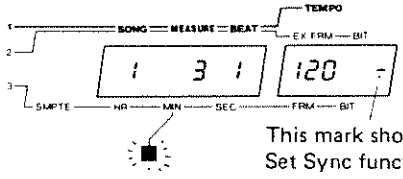
Taking the following procedure, you can start sync'ing at any position of the music data you want.

Operation

(1)By pressing the Display Selector Switch ❶, select the Display "1".

(2)Press the Measure Number Set Switch ❸. The switch lights up.

(3)By using the Ten Keys, input the number of measure where you wish to start sync'ing. Then hit the Enter Key.



This mark shows that the Set Sync function is in use.

Measure Number Set Switch

(4)Rewind or forward the VTR or MTR up to the appropriate position.

(5)Start the VTR or MTR. The sequencers and rhythm machines will start sync from the set measure.

To cancel the Set Sync function, stop the VTR or MTR, then press the SMPTE Switch.

3) Total Time Display

Refer to "4. Play Mode a.-3" on page 20.

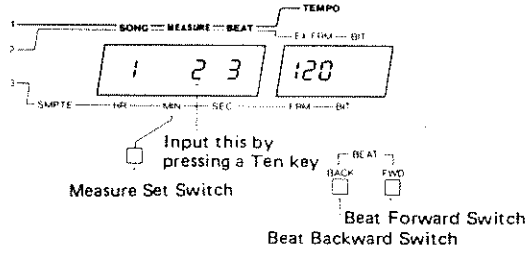
5. EDIT MODE (Advanced)

a. Editing the Programmed Tempo Data

Operation

(1)Press the Play Switch ⓬ and the Edit Switch ⓯ at the same time. The Edit Switch lights up, showing that the SBX-80 is now in the Edit mode.

(2)By using the Measure Set Switch ❸, the Beat Forward Switch ❼ and Beat Backward Switch ❻, go to the beat whose tempo data is to be edited.



(3)Press the Tempo Set Switch ❸.

(4)Input a new tempo data by using the Ten Keys.

(5)Hit the Enter Key.

Now, a new tempo data is programmed, and the Display shows the tempo value of the next beat.

b. Adding Tempo Data

Operation

(1)Press the Play Switch ⓬ and the Edit Switch ⓯ at the same time. The Edit Switch lights up showing that the SBX-80 is now in the Edit mode.

(2)Press the Measure Set Switch ❸. The switch lights up.

(3)By pressing the Ten Keys, input the number bigger than the total number of the measures programmed so far.

(4)Hit the Enter Key. The Measure Set Switch ❸ goes out, and the Display shows the programmed tempo value of the last beat.

(5)Press the Tempo Set Switch ❸. The switch lights up.

(6)Add the tempo data as many times as necessary.

c. Copy Function

The SBX-80 can copy a measure or measures of tempo data.

Note)
Copying a measure or measures to a certain place will inevitably erase the programmed data from that place to the end.

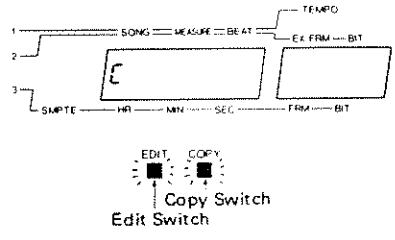
e.g.)
Copying the 1st and 2nd measure to the 5th measure for three times.

Operation

(1)Press the Play Switch ⓬ and the Edit Switch ⓯. The Edit Switch lights up showing that the SBX-80 is now in the Edit mode.

(2)Call the 5th measure. (Refer to a. Tempo Program with Ten Keys on page 17, if you are not sure how to call the measure you want.) The Display shows 5.

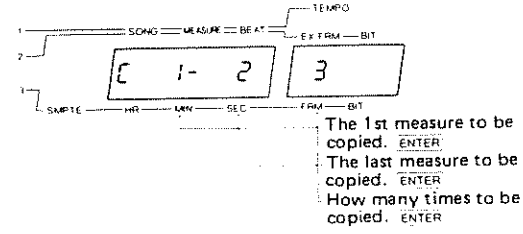
(3)Press the Copy Switch ⓭. The switch lights up and the Display shows C.



(4)Press the Ten Key 1 (to input the first measure to be copied), then hit the Enter Key.

(5)Press the Ten Key 2 (to input the last measure to be copied), then hit the Enter Key.

(6)Press the Ten Key 3 (to input how many times the data to be copied).



Now, the Copy Switch goes out showing that copying is completed. The Display shows 11, the number of the next measure.

d. Delete

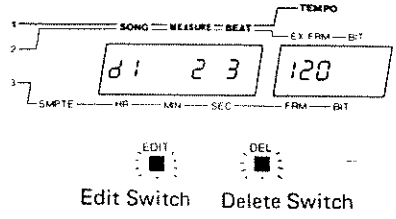
You can delete the programmed tempo data beat by beat. If, however the beat is the only beat in a measure, it cannot be deleted. So you will be bound to use the Clear function explained later.

Operation

(1)Press the Play Switch ⓬ and the Edit Switch ⓯ at the same time. The Edit Switch lights up showing that the SBX-80 is in the Edit mode.

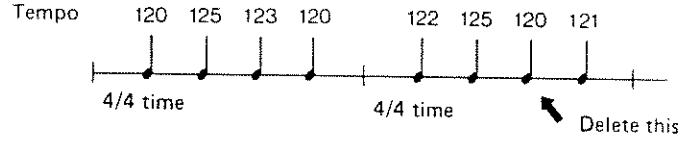
(2)Call the number of the beat whose tempo data you wish to delete, by using the Ten Keys. If you do not remember how to call the beat number, go back to "a. Tempo Program with Ten Keys" on page 17.
The Display shows the number of the beat currently called.

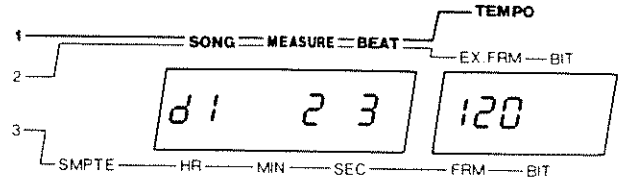
(3)Press the Delete Switch ⓱. The switch lights up, and the Display shows *d*.

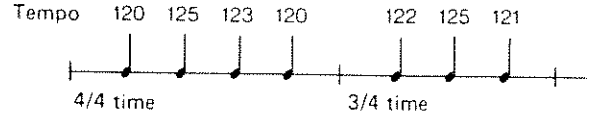


(4)Hit the Enter Key. The Delete Switch goes out, showing that the beat number shown in the Display just now has been deleted.

e.g.)
Deleting the 3rd beat in the 2nd measure.







*The time signature of this measure changes

e. Insert

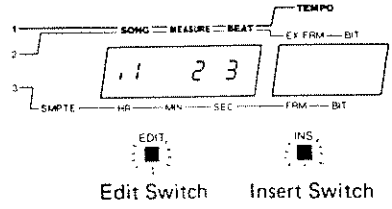
You can insert a beat of tempo data anywhere you like, unless the total number of the beats in a measure exceeds 15.

Operation

(1)Press the Play Switch ⓬ and the Edit Switch ⓯ at the same time.
The Edit Switch lights up showing that the SBX-80 is now in the Edit mode.

(2)Call the number of the beat where you wish to insert tempo value, by pressing the Ten Keys. If you do not remember how to call the beat number, see "a. Tempo Programming with Ten Keys" on page 17.
The Display shows the number of the beat currently called.

(3)Press the Insert Switch ⓲. The switch lights up, and the Display shows 1.

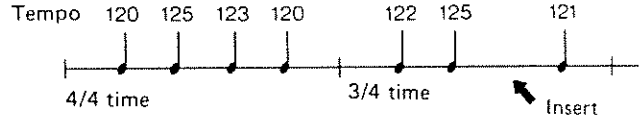


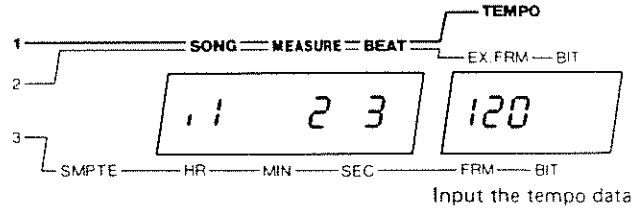
Edit Switch Insert Switch

(4)Input the tempo value by using the Ten Keys.

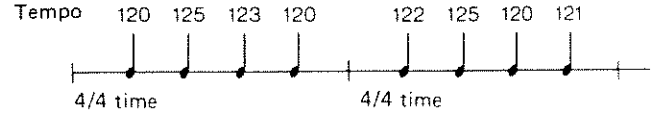
(5)Hit the Enter Key. The Insert Switch ⓲ goes out, and the tempo value shown in the Display will be inserted.

e.g.)
Inserting a tempo data into the 3rd beat in the 2nd measure.





Input the tempo data to be inserted by pressing the Ten Keys.



*The time signature has changed.

f. Song End

This is a clearing function that allows you to erase the tempo data from a certain measure to the very end of the musical piece.

Operation

(1)Press the Play Switch ⑫ and the Edit Switch ⑮ at the same time. The Edit Switch ⑮ lights up showing that the SBX-80 is now in the Edit mode.

(2)Call the measure from which to the end you wish to erase. If you do not remember how to call a measure number, see "a. Tempo Programming with Ten Keys" on page 17.
The Display will show the number of the measure to the end of the music.

(3)Press the Edit Switch ⑮, and still holding it down, press the Song End Switch ⑯. These two switches light up.

(4)Hit the Enter Key. The Song End Switch ⑯ goes out, and the data from the measure shown in the Display to the end will be all erased.

g. Bar Line

A musical piece programmed in the SBX-80 by tapping or click signal is bound to have the same time signature throughout the piece. Therefore, this Bar Line function is effectively used when a musical piece includes different beats.

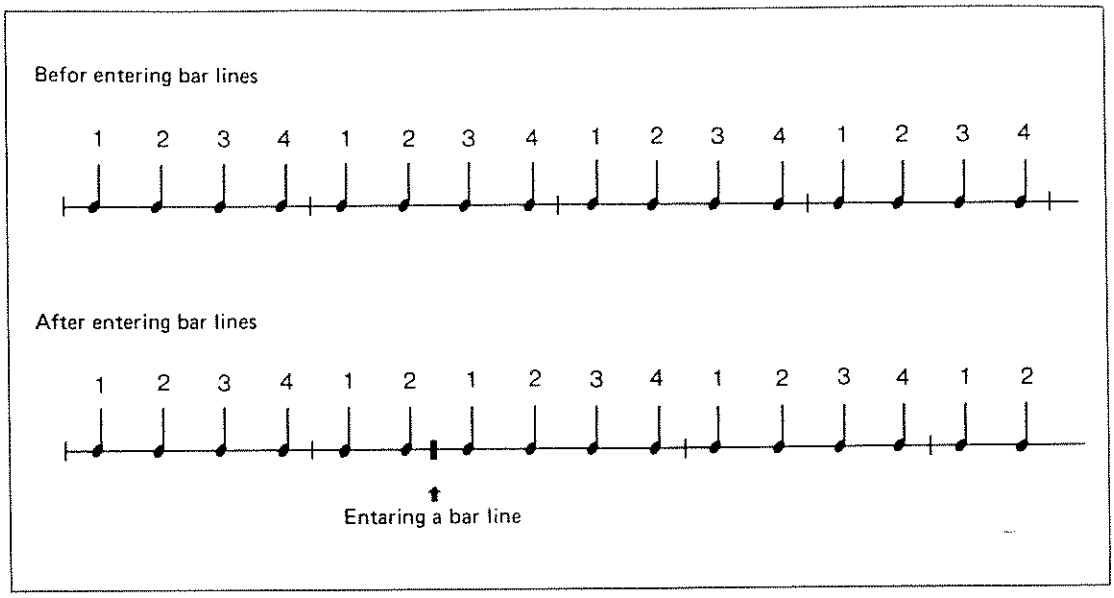
Operation

(1)Press the Play Switch ⑫ and the Edit Switch ⑮ at the same time. The Edit Switch ⑮ lights up showing that the SBX-80 is in the Edit mode.

(2)Call the measure where you wish to enter a bar line, and the Display Window responds with the number. If you do not remember how to call the measure see page 17.

(3)Press the Edit Switch ⑮, and without releasing it, press the Bar Line Switch ⑱. These switches light up.

(4)Press the Enter Key. The Bar Line Switch ⑱ goes out showing that the bar line is now entered.



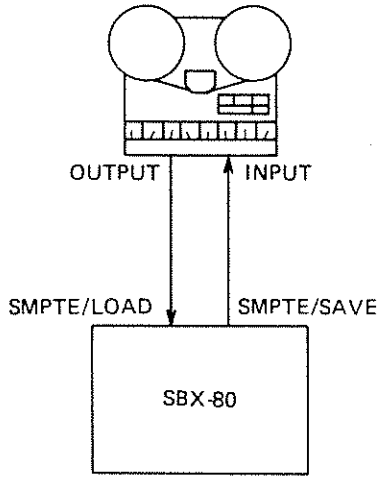
Note)

When you enter a bar line for setting a beat smaller than the one initially set, the following measures will be returned to the initial beat setting. So you need to repeat entering bar lines as many times. Also, when you enter a bar line for setting a beat bigger than the one initially set, the total measure number will be increased. This is because the bar lines of the initial beat setting still exist, as far as the bar line counting is connected.
After entering bar lines, call the last measure and erase the unnecessary part, using the Song End function. (see page 27).

6. SAVE, LOAD, VERIFY

The SBX-80 features tape interface that allows you to save the programmed data onto a tape. The saved data can be loaded from the tape into the SBX-80 at any time.

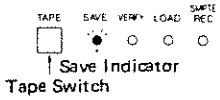
Connect the SMPTE/SAVE Jack ⓔ to the input jack of the tape recorder, and the SMPTE/LOAD Jack ⓓ to the output jack of the tape recorder.

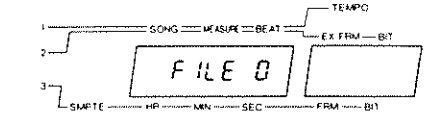


a. Saving

Operation

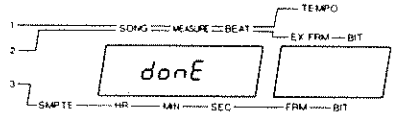
(1)Press the Tape Switch ㉙. The Save Indicator lights up, and the Display shows *F ILE 0*.





(2)Set the tape recorder to the recording mode, then start it. In 4 or 5 seconds, press the Start Button ⓴ of the SBX-80.

All the indicators on the SBX-80 go out, and now saving is going on.
When saving is completed, the Display shows *donE*.



In a few seconds later, press the Start Button of the SBX-80 to save the same data twice for reliability.

File Number

You can write a file number from 0 to 8 on your data. To write a file number, enter any number from 0 to 8 by pressing the relevant Ten Key and hitting the Enter Key.

b. Verification

The verification function allows you to verify if the data is correctly saved onto the tape.

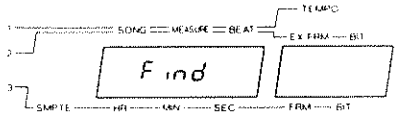
Operation

(1)By pressing the Tape Switch ㉓, light up the Verify Indicator.

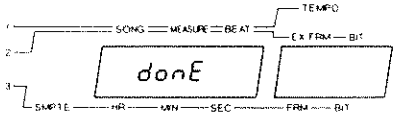
(2)If the Display shows the correct file number you have set in saving or you have not put any file number in saving, go to the step (3). And if the Display does not show the file number you have written in saving, set the number by pressing the Ten Key then the Enter Key.

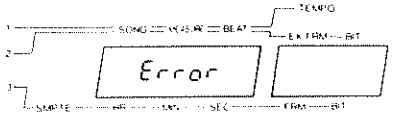
(3)Rewind the tape up to just before the head of saved data.

(4)Set the tape recorder to the playback mode. Start the tape recorder, then the SBX-80 by pressing the Start Button.
Now, all the indicators on the SBX-80 go out. When the SBX-80 starts reading data, the Display responds with *Find*.



When verification is completed, the Display shows *donE*.





(5)Stop the tape recorder.

If you wish to stop verifying in the middle of verifying, press the Sub Tap Button ㉑.

If there is any error, *Error* is shown instead of *donE*.

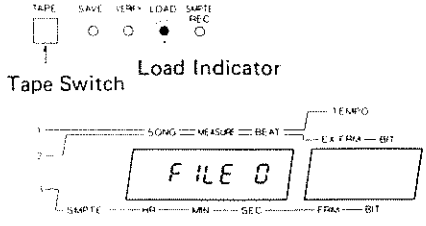
The error is most probably caused either by improper recording level in saving or playback level in verifying. Try patiently repeating the procedure in different levels until you succeed. A good quality tape will help.

c. Loading

Operation

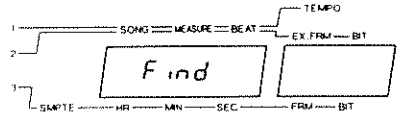
(1)By pressing the Tape Switch ㉓, light up the Load Indicator.
The Display shows F ILE 0 .

(2)If you have not written any file number, go to the step (3). Otherwise, set the same file number you set in saving (by Pressing the relevant Ten Key and the Enter Key).

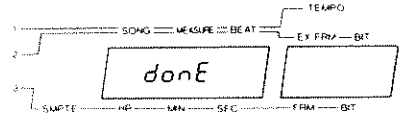


(3)Rewind the tape up to just before the head of saved data.

(4)Set the tape recorder to the playback mode, then start the tape recorder. Then start the SBX-80 by pressing the Start Button.
Now, all the Indicators on the SBX-80 go out. When the SBX-80 starts reading data, the Display shows F ind.



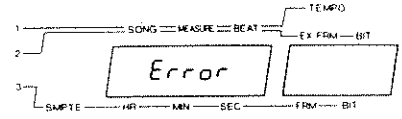
When data is loaded into the SBX-80, the Display shows donE .



(5)Stop the tape recorder.

If you wish to stop loading in the middle of loading, press the Sub Tap Button ㉑ .

If the Display shows Error instead of donE , try again loading with a different playback level.



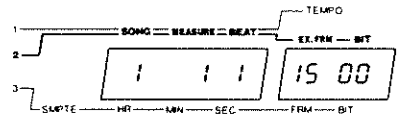
The data which has been verified should be properly loaded, unless the data tape itself is damaged.

5 Applications

1. TEMPO TIME DISPLAY

a. About Display "2"

Let's see how this works. Select "2' by using the Display Selector Switch ❶.



□ DISPLAY SELECT Display Selector Switch

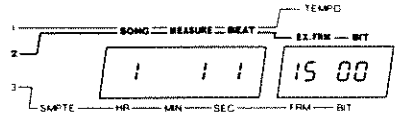
You see that the Tempo indication on the right part of the Display is different. This is the tempo value shown with frame and bit.

1 EX. FRM = 33.333ms (NTSC)
= 40.000ms (PAL, SECAN)

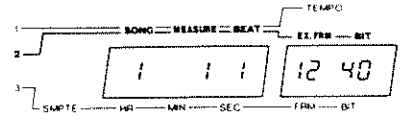
1 BIT = 1/80EX.FRM = 0.417ms (NTSC)
= 0.500ms (PAL, SECAM)

For instance, when the tempo is 120, the lengh of a beat is 500ms, therefore;

(NTSC)



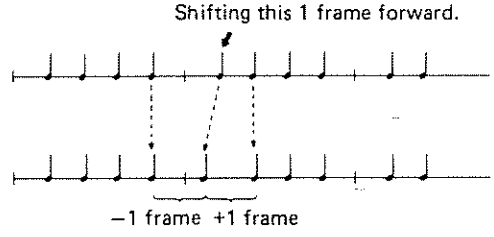
(PAL,SECAM)



b. Editing with Display "2"

The Display "2" mode also allows subtle change of tempo value.

Here is the example of editing the tempo value of a song in 4/4 time. To shift the tempo value of the 1st beat in the 2nd measure slightly forward, edit the 4th step in the 1st measure and the 1st beat in the 2nd measure.

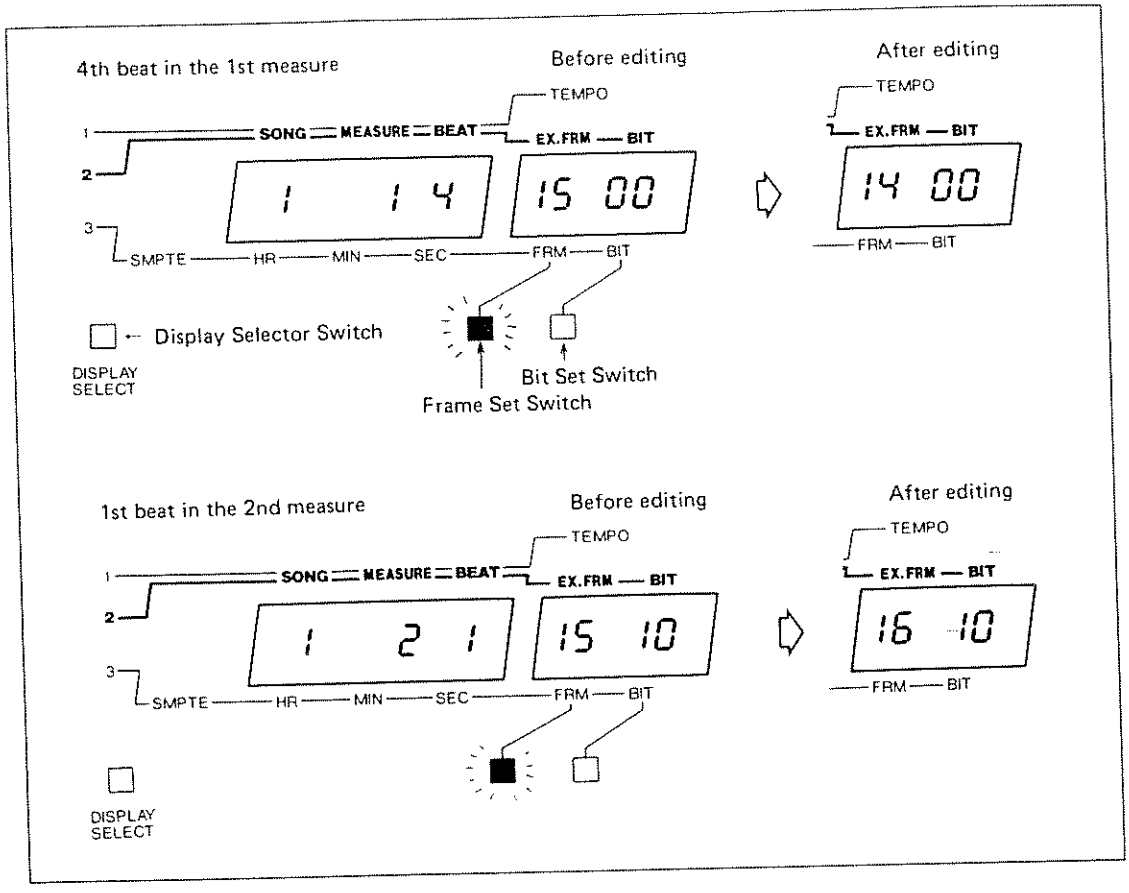


Operation

(1)Press the Play Switch ⓬ and the Edit Switch ⓭ at the same time. The Edit Switch lights up showing that the SBX-80 is now in the Edit mode.

(2)Call the 4th beat in the 1st measure. If you do not remember how to call a beat number, see "4. 3 Edit Mode 3) – 2" on page 17.
The Display shows the beat number currently called.

What you have to do now is reducing the tempo value of the 4th beat in the 1st beat by 1 frame, and add 1 frame to the 1st beat in the 2nd measure.



(3)Press the Display Selector Switch ❶ until the Display "2" lights up.

(4)Press the Frame Set Switch ❸ . The switch lights up.

(5)By using the Ten Keys ⑩ , input the value 1 frame smaller than then current tempo value of the 4th beat in the 1st measure. And hit the Enter Key ⑩ .

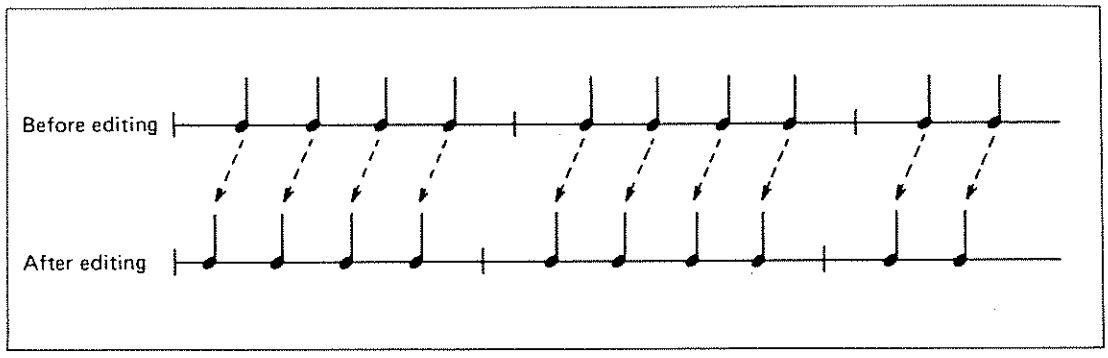
The Display shows the tempo data of the next beat (the 1st beat in the 2nd measure).

(6)By using the Ten Keys, input the value 1 frame bigger than the current tempo value of the 1st beat in the 2nd measure. The Display shows the tempo value of the next beat (the 2nd beat in the 2nd measure).

(7)Press the Frame Set Switch ❸ to stop editing. The Frame Set Switch goes out.

2. CHANGING OFFSET TIME

By editing the SMPTE Offset time, the timing of the entire piece is shifted forward or backward while the sequencers and rhythm machines are sync'ing with the VTR or MTR.



See 6) Recording SMPTE Time Code (Advanced) (3), (4) on page 15.

3. TIME DISPLAY UP TO A CERTAIN BEAT

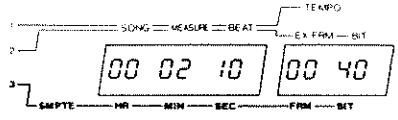
If you wish to know the time elasped up to a certain beat, take the following procedure.

Operation

(1)Press the Play Switch ⓬ and the Edit Switch ⓯ at the same time. The Edit Switch lights up showing that the SBX-80 is now in the Edit mode.

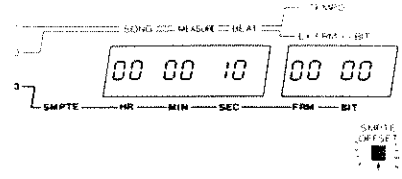
(2)Call the beat number. If you do not remember how to call a beat number, see " [4] 3. EDIT MODE 3) – 2" on page 17.

(3)Press the Display Selector Switch ❶ until the Display Indicator "3" lights up.



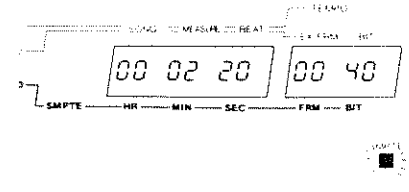
(4)Turning the SMPTE Switch ㉕ on will cause the Display to show the time with the SMPTE Offset added.

Display of SMPTE OFFSET



SMPTE OFFSET Switch

The Display of the elapsed time



4. TIME BASE

The Time Base Out on the rear panel outputs the pulse wave of 0 to 5V. The number of pulses in a quater note can be changed with the Time Base Selector Switch as 1, 2, 3, 4, 12, 24, 48, 96 and 120. The device operated in the same time base can sync to the SBX-80.

6 Specifications

Memory Capacity

Max. 3967 beats
- 991 Measures in 4/4
- 998 Measures in 3/4

Max. Playing Time (with M.M. ♩ = 120)
- Approx. 33 minutes in 4/4
- Approx. 25 minutes in 3/4

Front Panel

Tap Response Switch (Quick, Medium, Slow)
Tap Button
Sub Tap Button
Stop/Continue Button
Ten Keys (1 thru 9 and Enter Key)
Display Selector Switch
Set Switches (x 5)
SMPTE Offset Switch
Total Time Switch
Beat Backward Switch
Beat Forward Switch
Manual Switch
Play Switch
Record Switch
Count In Switch
Time Signature Switch
Tape Switch
Edit Switch
Copy/Song End Switch
Delete Switch
Insert/Bar Line Switch
Repeat Switch
SMPTE Switch (EXT, INT)
Tempo Knob (♩ = 20 to 250)
Metronome Level Knob
Audio In Level Knob
Time Base Selector Switch (1, 2, 3, 4, 12, 24, 48, 96, 120)

Rear Panel

Remote Jacks
- Start
- Stop/Continue

Input Jacks
- Audio In — Input Level –20dBm, Input Impedance 33kΩ
- SMPTE/LOAD
  - Tape Transfer Speed: 2400 bauds (30 Frm), 2000 bauds (25 Frm)
  - Input Level (1.5Vp–p to 1.0Vp–p)

Output Jacks
- SMPTE/SAVE — Output Level 1.5Vp–p
- Time Base — Output Level 0 to 5 V
- Metronome — Output Level 1 Vp–p MAX

MIDI Connectors
- IN — x 1
- OUT — x 2

DIN SYNC
- OUT — x 2

Power Switch

Dimension
325(W) x 303(D) x 107(H) mm
12-13/16" x 11-15/16" x 4-3/16"

Weight — 3.5 kg/7 lb 11 oz

Consumption — 11W

Accessories
- MIDI SYNC Cable (2.5m) x 1
- LP-25 x 1

* Specifications are subject to change without notice

Sync box

MODEL SBX-80 MIDI Implementation

1. TRANSMITTED DATA

1.1 While in MANUAL, PLAY, RECORD or EDIT mode

Status	Second	Third	Description	
1111 0010	Oppp pppp	Oppp pppp	Song Position Pointer	*1
1111 0011	Osss ssss		Song Select	*2
1111 1000			Timing Clock	*3
1111 1010			Start	
1111 1011			Continue	
1111 1100			Stop	

Notes:

*1 While in PLAY mode, and when the SMPTE switch is set at EXT, this unit will work in the AUTO-SYNC mode, then when the recorded SMPTE code signal is received from the TAPE SYNC IN, a proper Song Position Pointer first, then a Continue are transmitted.
While in PLAY mode, when the measure of the song is set by the numeric keyboard, the Song Position Pointer is sent

*2 When a song number is chosen by the numeric keyboard on the front panel.

*3 The Timing Clock is always transmitted even when receiving or transmitting the System Exclusive message.

1.2 While in TAPE mode

Only the System Exclusive Messages are transmitted for data communication as described in section 4

2. RECOGNIZED RECEIVE DATA

2.1 While in MANUAL, PLAY, RECORD or EDIT mode

No messages are recognized for its internal function

2.2 While in TAPE mode

No messages, except the System Exclusive, are recognized for its internal function

3. TRANSFERRED RECEIVE DATA

3.1 While in MANUAL, PLAY, RECORD or EDIT mode

The following messages received from MIDI IN are directly transmitted to MIDI OUT

Status	Second	Third	Description
100x nnnn	0kkk kkkk	0vvv vvvv	Note ON/OFF
1010 nnnn	0kkk kkkk	0vvv vvvv	Key after touch
1011 nnnn	0ccc cccc	0vvv vvvv	Control change, Mode message
110x nnnn	0vvv vvvv		Program change, Channel after touch
1110 nnnn	0vvv vvvv	0vvv vvvv	Pitch bender
1111 0000	0iii iiii	0ddd dddd	1111 0111 System Exclusive message
1111 0110			Tune request
1111 0111			EOX
1111 1110			Active sensing
1111 1111			System reset

3.2 While in TAPE mode

Messages described in 3.1, except the System Exclusive messages, are transferred. However, while communicating with the other unit by using the SBX-80's System Exclusive messages, which is described in section 4, no other messages are passed from MIDI IN to MIDI OUT

4. SBX-80 EXCLUSIVE MESSAGES

While in MANUAL, PLAY, RECORD or EDIT mode, All System Exclusive messages received from MIDI IN are directly transmitted to MIDI OUT.

While in TAPE mode, only the following messages are transmitted or recognized. All of other System Exclusive messages are ignored.

4.1 Message type

4.1.1 Want to send a file -- WSF recognized only

Byte		Description
1111 0000	F0H	Exclusive status
0100 0001	41H	Roland ID #
0101 0000	40H	Operation code = WSF
0111 1111	7FH	Unit number = no channel device
0110 0000	60H	Format type = SBX data
1111 0111	F7H	End of Exclusive

4.1.2 Request a file -- RQF recognized only

Byte		Description
1111 0000	F0H	Exclusive status
0100 0001	41H	Roland ID #
0101 0000	41H	Operation code = RQF
0111 1111	7FH	Unit # = no channel device
0110 0000	60H	Format type = SBX data
1111 0111	F7H	End of Exclusive

4.1.3 Data -- DAT

Byte		Description
1111 0000	F0H	Exclusive status
0100 0001	41H	Roland ID #
0101 0000	42H	Operation code = DAT
0111 1111	7FH	Unit # = no channel device
0110 0000	60H	Format type = SBX data
(00hh 0000)		(header 10H or 20H)
0000 dddd		Data (max 256 bytes)
:		
0000 dddd		
0sss ssss		Check sum
1111 0111	F7H	End of Exclusive

4.1.4 Acknowledge -- ACK

Byte		Description
1111 0000	F0H	Exclusive status
0100 0001	41H	Roland ID #
0101 0000	43H	Operation code = ACK
0111 1111	7FH	Unit # = no channel device
0110 0000	60H	Format type = SBX data
1111 0111	F7H	End of Exclusive

4.1.5 End of file -- EOF

Byte		Description
1111 0000	F0H	Exclusive status
0100 0001	41H	Roland ID #
0101 0000	45H	Operation code = EOF
0111 1111	7FH	Unit # = no channel device
0110 0000	60H	Format type = SBX data
1111 0111	F7H	End of Exclusive

4.1.6 Communication error -- ERR recognized only

Byte		Description
1111 0000	F0H	Exclusive status
0100 0001	41H	Roland ID #
0101 0000	4EH	Operation code = ERR
0111 1111	7FH	Unit # = no channel device
0110 0000	60H	Format type = SBX data
1111 0111	F7H	End of Exclusive

4.1.7 Rejection -- RJC

Byte		Description
1111 0000	F0H	Exclusive status
0100 0001	41H	Roland ID #
0101 0000	4FH	Operation code = RJC
0111 1111	7FH	Unit # = no channel device
0110 0000	60H	Format type = SBX data
1111 0111	F7H	End of Exclusive

4.2 Sequence of communication

While in one of TAPE modes (SAVE, VERIFY, LOAD or SMPTE REC) and when these functions are not operating, only the WSF and RQF are recognized, then when the WSF or RQF message is received, the communication sequence will start.
This unit does not have functions to begin the communication by itself.

4.2.1 When the WSF is received.

WSF	received
ACK	transmitted
DAT	received
ACK	transmitted
:	
:	
EOF	received
ACK	transmitted

4.2.2 When the RQF is received.

RQF	received
DAT	transmitted
ACK	received
:	
:	
EOF	transmitted
ACK	received

4.2.3 When the ERR is received while communicating

DAT	transmitted
ACK	received
RJC	transmitted

4.2.4 When the RJC is received while communicating

RJC	received

The communicating function will stop

4.3 Data format in the DAT messages

Each byte of the data divided 2 nibbles, right justified, LS nibble (lower nibble) is sent first.

a File header block (in the first DAT message)

Byte in DAT		Description
0001 0000	10H	Header
		SMPTE OFFSET
0000 hhhh		Lower nibble of Hour
0000 hhhh		Upper nibble of Hour
0000 mmmm		Lower nibble of Minute
0000 0mmm		Upper nibble of Minute
0000 ssss		Lower nibble of Second
0000 0sss		Upper nibble of Second
0000 ffff		Lower nibble of Frame
0000 00ff		Upper nibble of Frame
0000 bbbb		Lower nibble of Bit
0000 0bbb		Upper nibble of Bit
0000 000d		Beat division 0: 1/4, 1: 1/8
0000 000m		Metronome 0: no count 1: count

b Measure control block (in the second DAT message)

Byte in DAT	Description
	Beat per measure (1 - 15)
0000 bbbb	Lower nibble
0000 0000	Upper nibble
	Number of measures - 1
	(0 - 997)
0000 mmmm	Lower nibble of lower byte
0000 mmmm	Upper nibble of lower byte
0000 00mm	Lower nibble of upper byte
0000 0000	Upper nibble of upper byte
	Sets of 6 bytes
0000 0000	Data end mark (6 bytes)
0000 0000	
0000 0000	
0000 0000	
0000 0000	
0000 0000	

Notes

If the 2 measure count-in exists, the lower nibble of the first 'beat per measure' is the number of the beat, then the upper nibble of the first 'beat per measure' is 0000 1000, and the next 4 bytes are 0000 0001, 0000 0000, 0000 0000, 0000 0000 respectively, which indicate number of the count-in measures being 2.

If the number of bytes exceeds 256, the third message will follow from the next nibble.

Total of the measures will not exceed over 998.

c Data length block (in the third or fourth DAT message)

Byte in DAT		Description
0010 0000	20H	Header
		Length of data bytes (0 - 7934) *
0000 xxxx		Lower nibble of lower byte
0000 xxxx		Upper nibble of lower byte
0000 xxxx		Lower nibble of upper byte
0000 000x		Upper nibble of upper byte

Note :

* The length value equals doubled number of beats the song data consists of.

d Tempo data block

Byte in DAT	Description
	Tempo values in SMPTE format for the first beat
0000 bbbb	Lower nibble of Bit value
0000 0bbb	Upper nibble of Bit value
0000 ffff	Lower nibble of Frame value
0000 0fff	Upper nibble of Frame value
	Sets of 4 bytes for each beat
	Additional 4 byte data (same values of the end beat data)
0000 eeee	Lower nibble of Bit value
0000 0eee	Upper nibble of Bit value
0000 eeee	Lower nibble of Frame value
0000 0eee	Upper nibble of Frame value

Sync box

MODEL SBX-80 MIDI Implementation Chart

Function.....		Transmitted PLAY	Transmitted TAPE	Recognized PLAY	Recognized TAPE	Remarks
Basic Channel	Default	×	×	×	×	Not BASIC ch
	Changed	×	×	×	×	
Mode	Default	×	×	×	×	
	Messages	×	×	×	×	
	Altered	**********		×	×	
Note Number		×	×	×	×	*
	True voice	**********		×	×	
Velocity	Note ON	×	×	×	×	*
	Note OFF	×	×	×	×	
After Touch	Key's	×	×	×	×	*
	Ch's	×	×	×	×	
Pitch Bender		×	×	×	×	*
Control Change		×	×	×	×	*
Prog Change		×	×	×	×	*
	True #	**********				
System Exclusive		×	○	×	×	
System Common	Song Pos	○	×	×	×	
	Song Sel	○	×	×	×	
	Tune	×	×	×	×	*
System Real Time	Clock		○	×	×	
	Commands		○	×	×	
Aux Mes-sages	Local ON OFF	×	×	×	×	*
	All Notes OFF	×	×	×	×	
	Active Sense	×	×	×	×	
	Reset	×	×	×	×	
Notes		*Received messages are usually transmitted				

Mode 1 : OMNI ON, POLY Mode 2 : OMNI ON, MONO ○ : Yes

Mode 3 : OMNI OFF, POLY Mode 4 : OMNI OFF, MONO × : No

SBX-80

'87-08-E2-4L

Roland